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DOCUMENT-IDENTIFIER: US 20010015968 A1
TITLE: ENHANCED INTERWORKING FUNCTION FOR INTERFACING DIGITAL CELLULAR VOICE AND FAX PROTOCOLS AND INTERNET PROTOCOLS

Abstract Paragraph:
An enhanced interworking function (E-IWF) supports a method of direct digital interworking between a radio telecommunications network and standard Internet Protocol (IP) routers. A general purpose interworking function performs speech transcoding and data interworking. A specific translation interworking function translates directly between mobile-specific voice encoding and Voice-over-IP protocols, and between mobile-specific fax encoding and Fax-on-IP protocols. The method provides interworking between cellular protocols in a time division multiple access (TDMA) cellular telecommunications network, and Internet protocols being utilized by an Internet End-System (ES) or fax gateway.

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Summary of Invention Paragraph:
[0017] In yet another aspect, the present invention is a method of interworking between cellular fax protocols and Internet protocols, the cellular fax protocols being utilized by a mobile station in a time division multiple access (TDMA) cellular telecommunications network to transmit an image to a far-end fax machine via the Internet, and the Internet protocols being utilized by a fax gateway. The method begins by originating a mobile fax call, setting up a Radio Link Protocol (RLP) for communicating between the mobile station and the cellular telecommunications network, and scanning, encoding, and compressing the image into a fax data stream. This is followed by sending a sequence of digitized call establishment signals between an enhanced interworking function (E-IWF) in the cellular telecommunications network and the far-end fax machine, formatting the fax data stream into User Datagram Protocol (UDP) frames and segmenting the frames into Internet Protocol (IP) datagrams, and transmitting the UDP/IP datagrams over the Internet to the fax gateway. The method then performs the steps of converting, in the fax gateway, the UDP/IP datagrams into fax modem voiceband information, sending the fax modem voiceband information to the far-end fax machine, and recreating the image in the far-end fax machine.

CLAIMS:

16. A method of interworking between cellular fax protocols and Internet protocols, said cellular fax protocols being utilized by a mobile station in a time division multiple access (TDMA) cellular telecommunications network to transmit an image to a far-end fax machine via the Internet, and said Internet protocols being utilized by a fax gateway, said method comprising the steps of: originating a mobile fax call; setting up a Radio Link Protocol (RLP) for communicating between said mobile station and said cellular telecommunications network; scanning, encoding, and compressing the image into a fax data stream; sending a sequence of digitized call establishment signals between an enhanced interworking function (E-IWF) in the cellular telecommunications network and the far-end fax machine; formatting the fax data stream into User Datagram Protocol (UDP) frames and segmenting the frames into

Internet Protocol (IP) datagrams; transmitting the UDP/IP datagrams over the Internet to the fax gateway; converting, in the fax gateway, the UDP/IP datagrams into fax modem voiceband information; sending the fax modem voiceband information to the far-end fax machine; and recreating the image in the far-end fax machine.

17. The method of interworking between cellular fax protocols and Internet protocols of claim 16 further comprising, after the step of scanning, encoding, and compressing the image into a fax data stream, the steps of: sending a sequence of call establishment signals between an enhanced interworking function (E-IWF) in the cellular telecommunications network and the far-end fax machine, said signals being sent as voiceband tones modulated by a modem; modulating information carried by said RLP from said mobile station with a fax modem to form a voiceband fax modem signal; and re-encoding the voiceband fax modem signal utilizing a Voice-over-IP codec.